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Corema Conradii and its Localities.

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Referring to Dr. Gray's exhaustive paper in Chloris Boreali-Americana* for a full description and careful figures of this species, and for an account of its morphological relations, the object of this article is simply to place on record such facts connected with its known localities and environment as may tend to elucidate the past history of a plant now so sparsely represented in the existing flora. While its near relative, *Empetrum nigrum*, abundantly clothes the mountain heights and colder regions of the northern hemisphere, our *Corema* is restricted to very limited spaces in widely separated localities, in the district extending from New Foundland to New Jersey. Having been favored with opportunities to examine the principal known localities within our own limits, my notes will follow, as nearly as may be, the order of their discovery.

1. *New Jersey Pine Barrens.*—It is said to have been first discovered by Prof. Solomon W. Conrad as early as 1831 near Pemberton Mills, about ten miles from Burlington, N. J., and a fragment so ticketed (with a ?) is in the herbarium of the Philadelphia Academy. Soon after, Rafinesque collected it at Cedar Bridge, Monmouth Co., about twenty-two miles south-east of Pemberton. This locality was visited about 1833 by Dr. Torrey, who published the first description of the plant under the name of *Empetrum Conradii*, in *Annals* of N. Y. Lyceum of Nat. Hist. iv., 83. In April, 1869, in company with the late Charles F. Parker, I made some examination of the vicinity of Pemberton and also visited Cedar Bridge in search of the plant. The encroachment of cultivation near the former place discouraged search, but at Cedar Bridge the localities which Dr. Torrey in his paper has so carefully indicated were readily identified. But no trace of the plant was seen either at these points or elsewhere during a search of some hours. Dr. Torrey described it as growing in a few patches "in the pure white sand of that region." These places, as I now remember them, were quite bare of vegetation at that early spring season, but the prevailing tree growth of all that region is a very stunted form of *Pinus rigida*. At the time of Rafinesque's and Torrey's visits, Cedar Bridge was an inn for the accommodation of the limited summer travel of that period by stage-coach between Philadelphia and Barnegat Bay. Now alas, an occasional clam-wagon is the only visitant, and as I remember the

* *Memoirs* of Amer. Acad. Arts and Sciences. 2d series iii. pp. 3-14, tab. i. (1846.)

house in 1869 it was as rough a hostelry as it has been my lot to encounter. I have some doubt whether Conrad's and Rafinesque's localities were not the same.

Dr. Knieskern is said to have found the plant at other points in Monmouth Co., but this has not been confirmed, nor is the *Corema* enumerated in his Catalogue of the plants of Monmouth and Ocean Counties published in 1856. There is, however, a large tract of absolute wilderness lying between the New Jersey Southern R. R. and Barnegat Bay which may reward exploration.

2. *Long Island.*—Dr. Torrey, in the Flora of New York ii., 519, says that Dr. Emmons had given him specimens of *Corema* collected, as nearly as he could remember, "on the road from Oyster Bay to Hempstead, but possibly near Islip." It does not seem to have since been found, and Mr. Coles, of Glen Cove, "has sought it very generally in Queens and Suffolk Counties in the most likely places without even finding a single specimen." (BULLETIN OF TORREY CLUB iii., 5) and Mr. E. S. Miller in his careful Catalogue of the Plants of Suffolk Co., does not enumerate it.

3. *Plymouth, Mass.*—This is the best known and most abundant locality, and has furnished most of the specimens hitherto found in our herbaria, and was mode known in 1838 and 1839 by Tuckerman, Oakes and others. Mr. Tuckerman recognized the Plymouth plant as identical with that from Cedar Bridge described by Dr. Torrey, and communicated specimens with ripe fruit to Dr. Klotzsch of Berlin, who in 1841 proposed to separate it from *Empetrum* under the name of *Tuckermannia.** This name had, however, been already applied by Nuttall to a California Composite, and so Tuckerman, in London *Journal of Botany* i., 445, in the year 1842, proposed for it the name of *Oakesia* in compliment to William Oakes. Dr. Gray, however, in the paper referred to at the head of this article, showed that there was nothing in the generic character to separate it from the existing genus *Corema* established by Dr. Don in 1826 upon *Empetrum album*, L.

In visiting this locality, August 7th, 1885, I had the company of Dr. Gray and the guidance of Benj. M. Watson, Jr., Professor of Horticulture in the Bussey Institute. I found it presenting an aspect very different from those yet to be mentioned. Here I saw the plant, as Emerson† well describes it, "clothing one open, sunny hill of some acres, strongly reminding one of the description of the heaths of Europe." This hill, like most of those in the vicinity, is a deep deposit of gravel largely composed of quartz. Where the rains have washed out the loamy vegetable matter the residuum is a coarse sand much like that of the Jersey barrens. I am sure that there is more of the plant here than in all the localities I have yet to mention, and Mr. Watson informed us that the tenure of the land is such that the *Corema* is not likely to be disturbed for many years to come, and will never be ruthlessly destroyed. Portions of it had apparently died out, probably from the extreme drought of 1883,

* Erichson Archiv., 1841, p. 248.

† Trees and Shrubs of Massachusetts. 1st edition, 1846, p. 328.

but new seedlings are springing up, and we may hope that it will long remain as one of the many attractions of the beautiful town which bears so many rich historical associations. The tree growth around is sparse, composed mostly of *Pinus rigida* with some *Quercus coccinea* and *Betula alba* The *Corema* covers the position so thoroughly that there is room for little other undergrowth, but occasional plants of *Gaylussacia resinosa*, *Vaccinium vacillans*, *Comptonia asplenifolia* and *Baptisia tinctoria* are seen.

Mr. Watson informed us that he had also seen the *Corema* near Truro, Cape Cod, and near one of the coves of Buzzard Bay.

4. *Bath, Maine.*—In 1840, Mr. W. Gambell, a pupil of Nuttall, furnished to Dr. Gray specimens of *Corema* gathered in the spring of 1839 "on the rocky banks of the Kennebec in the neighborhood of Bath." Since then little seems to have been known of this locality. On the 5th of August, of this year, I visited Bath for the purpose of making some search in that vicinity. Bad weather shortened my visit and prevented me from examining the banks of the Kennebec; but a few hours spent upon the high grounds west of the city led me to a second range of hills covered with a dense young growth of trees, much of it white pine. On the higher part of the ridge, where the granitic rocks crop out into bare ledges some acres in extent, I found a considerable quantity of the *Corema*, perhaps in all twenty patches, all within the limit of a few rods. The rock contains a large proportion of quartz, and the scanty soil showed much silex. Here the tree growth was *Pinus rigida* in scattered, stunted examples, with some few small trees of *Betula alba*. As this locality was not near the banks of the Kennebec, but two miles west of them, I was at first inclined to believe it new, but I have since been informed that Prof. Goodell had collected the plant, probably at the same point, and also on the eastern bank of the river.

5. *Isle au Haut, Maine.*—This is the outermost island in Penobscot Bay, about six miles in length, two and a half miles in width, the central ridge rising to a height of 400 to 450 feet, being the highest island upon the coast except the mountainous one of Mount Desert. It is mostly wooded, but has on its northwesterly side a scattered village of about 200 inhabitants, who live upon the produce of the sea, and it is said that the first horse seen upon the island was landed only two months ago. The island has hitherto been rather inaccessible, but will doubtless soon become a summer resort and be made more easy of approach. The existence of *Corema* here was first discovered by A. Young, Jr., a student of Bangor, who communicated the plant to Dr. Gray in October, 1847. Mr. Young found it upon the high barren summit of the island, in considerable abundance, associated with *Potentilla tridentata*. I visited the island July 21st and 22d, 1884, and in the first house I entered it was my good fortune to meet an accomplished botanist, Mrs. Flora E. Haines of Bangor, who had spent several summers here and whose familiarity with the topography, botany and local history of the island relieved me from the loss of time and the possible failure which might have attended the hurried visit of a perfect stranger. Under her guidance the summit of the island was

reached, doubtless the point visited by Mr. Young. There we found the *Corema*, but only sparingly. The hill-top had been overrun by fire a few years ago, and it was evident that the plant had narrowly escaped extinction. This fact is a suggestive one as connected with the very local distribution of our *Corema*, and it is very probable that a similar cause has been for ages narrowing its field of existence. Yet some new sprouts gave promise of good increase if botanists give it fair treatment. The scanty soil in which it grows is composed of a finely comminuted granite of which quartz is the chief ingredient. Associated with the *Corema* were *Potentilla tridentata*, *Vaccinium Pennsylvanicum*, *Cornus Canadensis*, with here and there a stunted spruce.

I was then conducted to a bare, round, rocky knob, perhaps 150 feet in height, about $1\frac{3}{4}$ miles W. S. W. of the locality just mentioned, and overlooking Moore's Harbor. This hill has the local name of "Black Dinah," and on its summit the *Corema* grows in sufficient abundance, in numerous large patches after the manner of *Empetrum*. The rock is composed almost entirely of quartz, and the scanty soil is made up of its particles, and an occasional rock crevice gives foothold for the firmly rooted *Corema*. The associated plants were mainly the same as in the locality last mentioned, except that a few dwarf examples of *Pinus rigida* were scattered about. I was informed that a third locality exists on the rocky shore between Black Dinah and the little village opposite Kimball's Island, and another on the eastern side of the island. *Empetrum nigrum* is also found on Isle au Haut, and on the neighboring Kimball's Island, and is very abundant on many of the rocky headlands of Mt. Desert twenty-five or thirty miles distant, and I have recently been informed that *Corema* has been seen upon Green Mt., the highest part of Mt. Desert, but I need some more positive evidence that the plant there seen was not *Empetrum*, and further search in other of the many large islands of Penobscot Bay some of them many square miles in area, and upon the numerous promontories of the main land will probably yet reveal other localities

Nova Scotia and Newfoundland.—Mr. Tuckerman saw in the Lambert Herbarium in London specimens collected in Newfoundland by Cormack. In Nova Scotia it has been seen in Halifax Co. by Lindsay and Sommers, and at Wilmot, Annapolis Co., by Howe. I know nothing further as to these localities, but hope that our botanical brethren from the British Provinces will give us further facts.

7. *Shawangunk Mts., N. Y.*—All the localities hitherto mentioned are maritime, or so near the sea-coast that when in 1881 it was announced that the *Corema* existed in Ulster Co., N. Y., on a mountain top, eighty miles from the coast, some surprise was created, and botanists were led to call to mind how, in like manner, *Hudsonia* and *Leiophyllum* are perfectly at home on mountain summits in North Carolina. Mr. Smiley, proprietor of the Minnewaska House, a well-known summer resort in the Shawangunk Mountains, in 1881 called the attention of Aubrey H. Smith to the plant, who identified it as *Corema*, and reported the fact to the Botanical Section of the Phil. Acad. (See *Proc.* Phil. Acad., 1882, p. 35). Mr.

Charles E. Smith visited the locality May 2d, 1882, obtained good flowering specimens, and published his notes in the TORREY BULLETIN, Vol. ix:, 1882. My own visit to the locality was June 26th, 1884, at which time the fruit was just perfecting. The Shawangunk Mountains consist of long, narrow ridges, extending from the Rondout Valley, southwesterly into New Jersey, crossing the Delaware River at the Water Gap, extending thence through Pennsylvania into Virginia. By the New York geologists the formation was named the Shawangunk Grit, and it is by Dana, in the latest edition of his Manual of Geology, referred to the Oneida Group. It is almost entirely composed of sand-stones and conglomerates, and is remarkable for the number of lakes or ponds which are found at frequent intervals throughout its extent, and of which L. Mohonk and L. Minnewaska are examples. The ridge at L. Minnewaska, and that running southwest from it, forming the easterly wall of Palmaghett Glen are of nearly pure quartz rock, bearing a scanty growth of scrub pine and white birch. The latter ridge extends about two miles, is then broken by a deep depression, rising again into a promontory called Gertrude's Nose. The height is from 1,500 to 1,800 feet above the sea. Following this ridge for nearly two miles beyond the lake, we find the *Corema* in frequent patches along the open sunny spaces on the western side of the path along the brow of the ridge, over a space of several hundred yards in length. Occasional starved examples of *Pinus rigida* are the only tree growth, and the associated plants are *Kalmia angustifolia*, *Gaylussacia resinosa* with some *Kalmia latifolia* and *Gaultheria procumbens*. The scanty soil in the rock crevices and on the rocks is of course derived from the pure quartz rock. On the ridge, beyond the depression above mentioned, the *Corema* is said to grow in still greater abundance, but I was not able to reach that point. I think we need be under no apprehension of the exhaustion of the plant by collectors, but the danger of destruction by fire is much greater.

I have thus given the facts connected with the distribution of this interesting species. I believe that a consideration of them will lead to discoveries of new localities, and to an extension of its known field. It is curious that the first discovery of the plant was made at the extreme southern end of its known area, at points where it seems not to have been abundant, and from which it has disappeared.

The Microvegetation of Bank-Notes, by Dr. Jules Schaarschmidt, Privatdocent of Cryptogamic Botany and Anatomy of Plants, Assistant of the Botanic Institutes and Gardens. Royal Hungarian University, Kolosvár.—The recent researches of Paul Reinsch in Erlangen have revealed the occurrence, on the surfaces of the coins of many nations, of different bacteria and two minute algæ (*Chroöcoccus monetarum* and *Pleurococcus monetarum*, P. Reinsch), living in a thin incrustation of organic detritus composed especially of starch-grains fibres, etc., deposited upon their surfaces during the course of long circulation. This thin incrustation renders the coins very suitable for this microvegetation, but the same phenomenon is exhibited by